

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-41

Name: Lake Hanson

County: Hanson

Legal Description: T102-R58-Sec. 21

Location from nearest town: 2 miles south of Alexandria, SD

Dates of present survey: August 11-12, 2008

Date last surveyed: August 14-16, 2006; June 13, 2006 (electrofishing)

Primary Game Species	Other Species
Largemouth Bass	Walleye
Bluegill	Channel Catfish
White Crappie	Black Bullhead
Black Crappie	Hybrid Sunfish

PHYSICAL DATA

Surface Area: 55 acres

Maximum depth: 17 feet

Volume: 418 acre-feet

Contour map available: yes

Lake elevation observed during the survey: Full

Beneficial use classifications: (5) warmwater semipermanent fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Watershed area: 40,053 acres

Mean depth: 8 feet

Shoreline length: 2.2 miles

Date mapped: 1970

Introduction

Lake Hanson is an artificial impoundment constructed by the Works Progress Administration (WPA) in 1934. It was named by a local lake committee in honor of the county.

On May 6, 2007, the emergency spillway section of the dam washed out following heavy rains and the lake was almost completely drained. The dam was quickly repaired and the lake refilled later that summer. This is the first survey to check the fish population since the event.

Ownership of the Lake and Adjacent Lakeshore Property

The dam impounding Lake Hanson is owned by the South Dakota Department of School and Public Lands and the South Dakota Department of Game, Fish, and Parks (GFP) is responsible for managing the fishery. The land surrounding Lake Hansen is privately owned. However, two easements created in 1934, permit public access to a strip of land lying 12 feet above the ordinary high water mark around the entire lake.

Fishing Access

There is a concrete-plank boat ramp owned by Hanson County on the north side of the lake capable of handling most boats. Shore fishing is available at various sites along the north shore.

Field Observations of Water Quality and Aquatic Vegetation

Water clarity at the time of the survey was good with a Secchi depth measurement of 86 cm (34 in). Common cattail (*Typha spp.*) was found around most of the south shoreline and sparse beds of sago pondweed (*Potamogeton pectinatus*) and coontail (*Ceratophyllum demersum*) were also observed.

BIOLOGICAL DATA

Methods:

Lake Hanson was sampled on August 11-12, 2008 with four overnight trap-net sets. The trap nets are constructed with 19-mm-bar-mesh ($\frac{3}{4}$ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. Sampling locations are displayed in Figure 5.

Results and Discussion:

Trap Net Catch

Black crappie (30.7%), northern pike (26.7%), and bluegill (17.3%) comprised the majority of the trap net catch (Table 1). Other species sampled included white crappie, common carp, yellow perch, channel catfish, and largemouth bass.

Table 1. Total catch from four overnight trap net sets at Lake Hanson, Hanson County August 11-12, 2008.

Species	Number	Percent	CPUE ¹	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Crappie	23	30.7	5.8	+4.3	42.7	100	55	107
Northern Pike	20	26.7	5.0	+3.2	0.6	55	0	80
Bluegill	13	17.3	3.3	+2.9	48.1	54	0	95
White Crappie	8	10.7	2.0	+1.4	44.9	--	--	--
Common Carp	6	8.0	1.5	+1.1	0.2	--	--	--
Yellow Perch	2	2.7	0.5	+0.6	9.5	--	--	--
Channel Catfish	2	2.7	0.5	+0.4	0.7	--	--	--
Largemouth Bass	1	1.3	0.3	+0.3	0.0	--	--	--

* 4 years (1996, 2002, 2004, 2006)

¹ See Appendix A for definitions of CPUE, PSD, RSD-P and mean Wr.

Bluegill

Management objective: Maintain a bluegill fishery with a trap net CPUE of at least 20 and RSD-18 of at least 20.

Bluegill trap-net CPUE decreased significantly indicating a significant portion of the population was washed downstream following the dam breach (Table 2). The remaining bluegills range in length from 9 - 17 cm (3.5-6.7 in) (Figure 1) which is similar to previous years. Lake Hanson was stocked with 22,900 bluegill fingerlings in 2008 to help rebuild the population (Table 6).

Table 2. Bluegill trap-net CPUE, PSD, RSD-18, RSD-P, and mean Wr for Lake Hanson, Hanson County, 2000-2008.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE			8.9		89.6		36.6		3.3
PSD			64		12		45		54
RSD-18			18		2		16		0
RSD-P			6		1		12		0
Mean Wr			112		88		96		95

White Crappie

Management objective: Maintain a crappie fishery with a trap net CPUE of at least 20 and PSD of at least 40

White crappie abundance in Lake Hanson was already low before the dam was breached and didn't decline much afterwards (Table 3). The eight fish sampled during the survey ranged in length from 230-320 mm (9.1-12.6 in) (Figure 2).

Table 3. White crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Lake Hanson, Hanson County, 2000-2008.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE			4.3		27.2		2.4		2.0
PSD			98		19		68		--
RSD-P			37		4		64		--
Mean Wr			106		87		89		--

Black Crappie

Management objective: Maintain a crappie fishery with a trap net CPUE of at least 20 and PSD of at least 40.

Like bluegills, a large portion of the black crappie population was washed downstream when the dam failed. However, unlike bluegills, the size structure of the black crappie population improved with over 50% of the fish sampled measuring over 25 cm (10 in.) (Table 4 and Figure 3).

Table 4. Black crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Lake Hanson, Hanson County, 2000-2008.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
CPUE			16.7		66.0		74.2		5.8
PSD			95		4		14		100
RSD-P			9		0		5		55
Mean Wr			105		111		99		107

All Species

The same species found before the breach in the dam and drawdown are still present, but generally in lower abundance with the exception of northern pike (Table 5). It appears a large number of pike entered the lake from upstream when the lake refilled.

Table 5. Electrofishing (EF) and trap-net (TN) CPUE for all fish species sampled in Lake Hanson, Hanson County, 1999-2008.

Species	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
COC (EF)		17.7		--		--		--		--
COC (TN)		--		--		--		0.1		1.5
BLB (EF)		5.4		--		--		--		--
BLB (TN)		--		0.6		0.4		--		--
CCF (EF)		2.3		--		--		--		--
CCF (TN)		--		--		--		0.8		0.5
NOP (TN)		--		0.8		0.4		0.4		5.0
GSF (EF)		1.5		--		--		--		--
GSF (TN)		--		--		--		--		--
HYB (TN)		--		0.1		--		--		--
BLG (EF)		76.9		--		--		--		--
BLG (TN)		--		8.9		89.6		36.6		3.3
LMB (EF)		6.2		--		36.8		9.0		--
LMB (TN)		--		--		0.2		--		0.3
WHC (EF)		50.8		--		--		--		--
WHC (TN)		--		4.3		27.2		2.4		2.0
BLC (EF)		41.5		--		--		--		--
BLC (TN)		--		16.7		66.0		74.2		5.8
YEP (TN)		--		0.7		1.2		35.9		0.5
SXW (EF)		8.5		--		--		--		--
WAE (EF)		43.1		--		--		--		--
WAE (TN)		--		0.7		--		--		--

CCF (Channel Catfish), LMB (Largemouth Bass), NOP (Northern Pike), SXW (Saugeye), WAE (Walleye), BLC (Black Crappie), BLG (Bluegill), GSF (Green Sunfish), HYB (Hybrid Sunfish), WHC (White Crappie), YEP (Yellow Perch), BLB (Black Bullhead), COC (Common Carp),

MANAGEMENT RECOMMENDATIONS

1. Restore the Lake Hanson fishery by stocking crappies, bluegills and largemouth bass as needed.
2. Continue to monitor the fish populations every other year by netting and electrofishing surveys.

Table 6. Stocking record for Lake Hanson, Hanson County, 1991-2008.

Year	Number	Species	Size
1991	3,100	Largemouth Bass	Fingerling
1996	1,336	Walleye	Lrg. Fingerling
1997	1,375	Saugeye	Fingerling
	1,375	Walleye	Fingerling
1998	801	Saugeye	Fingerling
	1,335	Walleye	Fingerling
1999	637	Saugeye	Lrg. Fingerling
	1,375	Walleye	Fingerling
2002	2,000	Largemouth Bass	Fingerling
2008	22,900	Bluegill	Fingerling
	6,560	Largemouth Bass	Fingerling

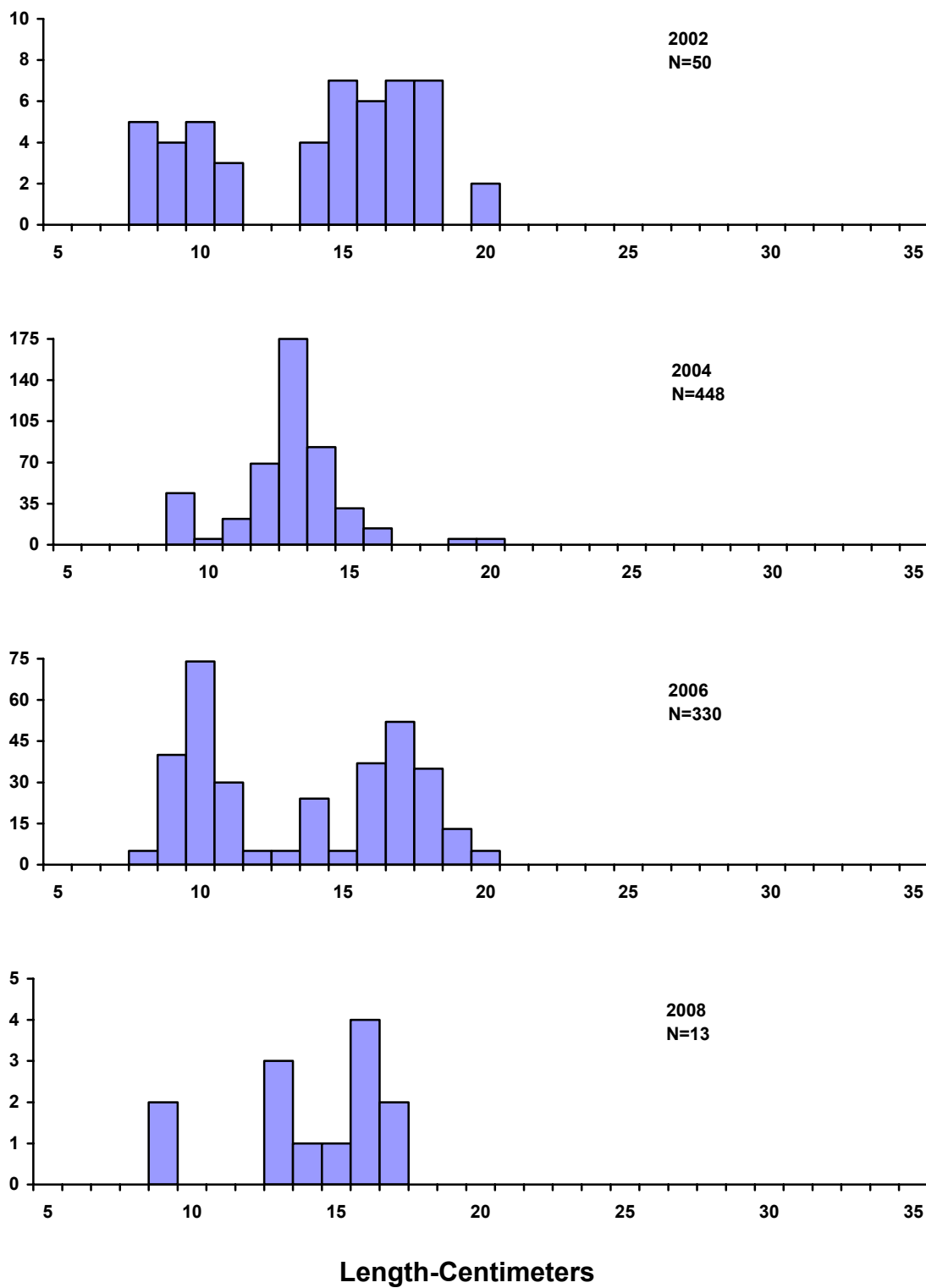


Figure 1. Length frequency histograms for bluegills sampled with trap nets in Lake, Hanson, Hanson County, 2002, 2004, 2006, 2008.

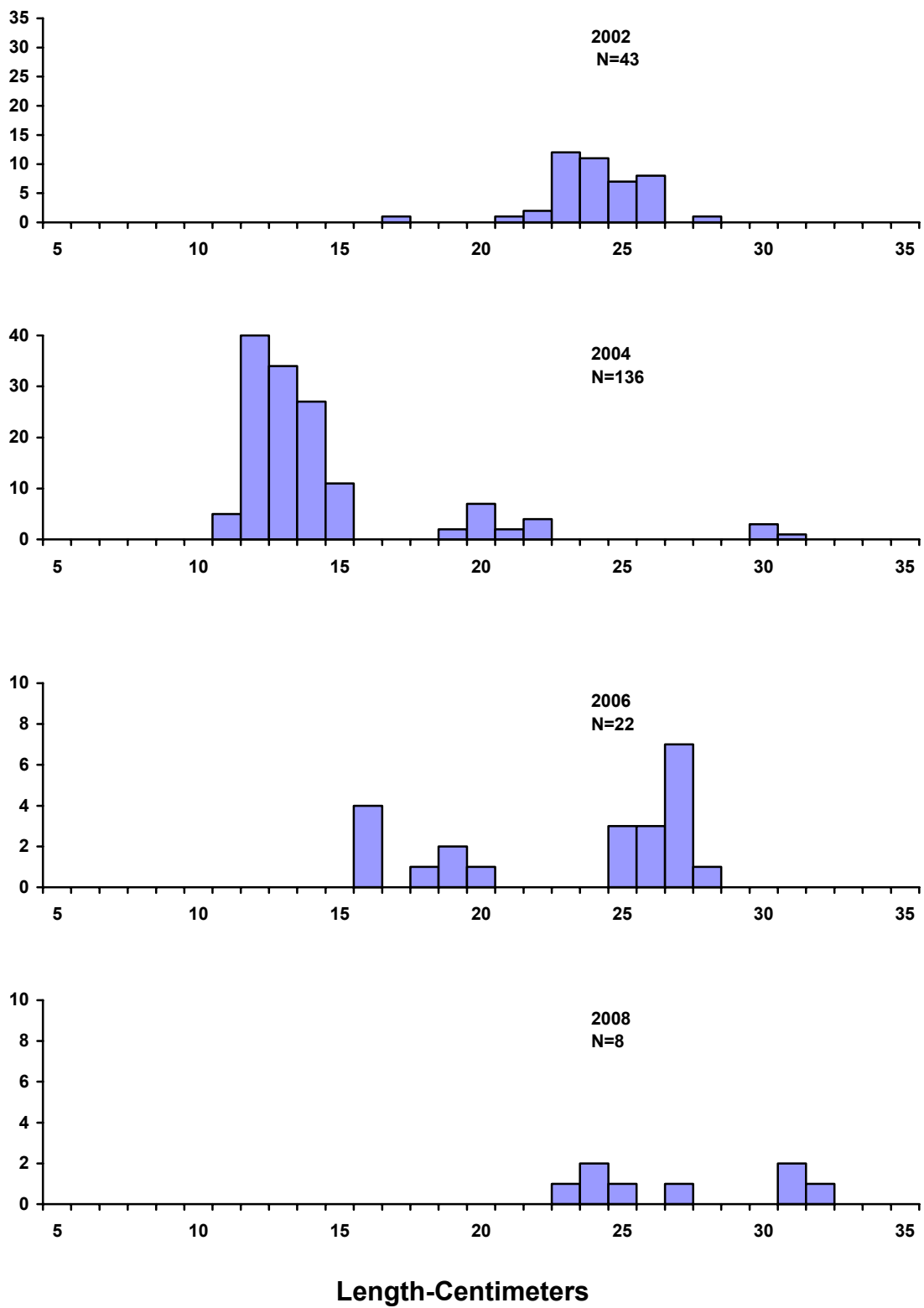


Figure 2. Length frequency histograms for white crappies sampled with trap nets in Lake Hanson, Hanson County, 2002, 2004, 2006, 2008.

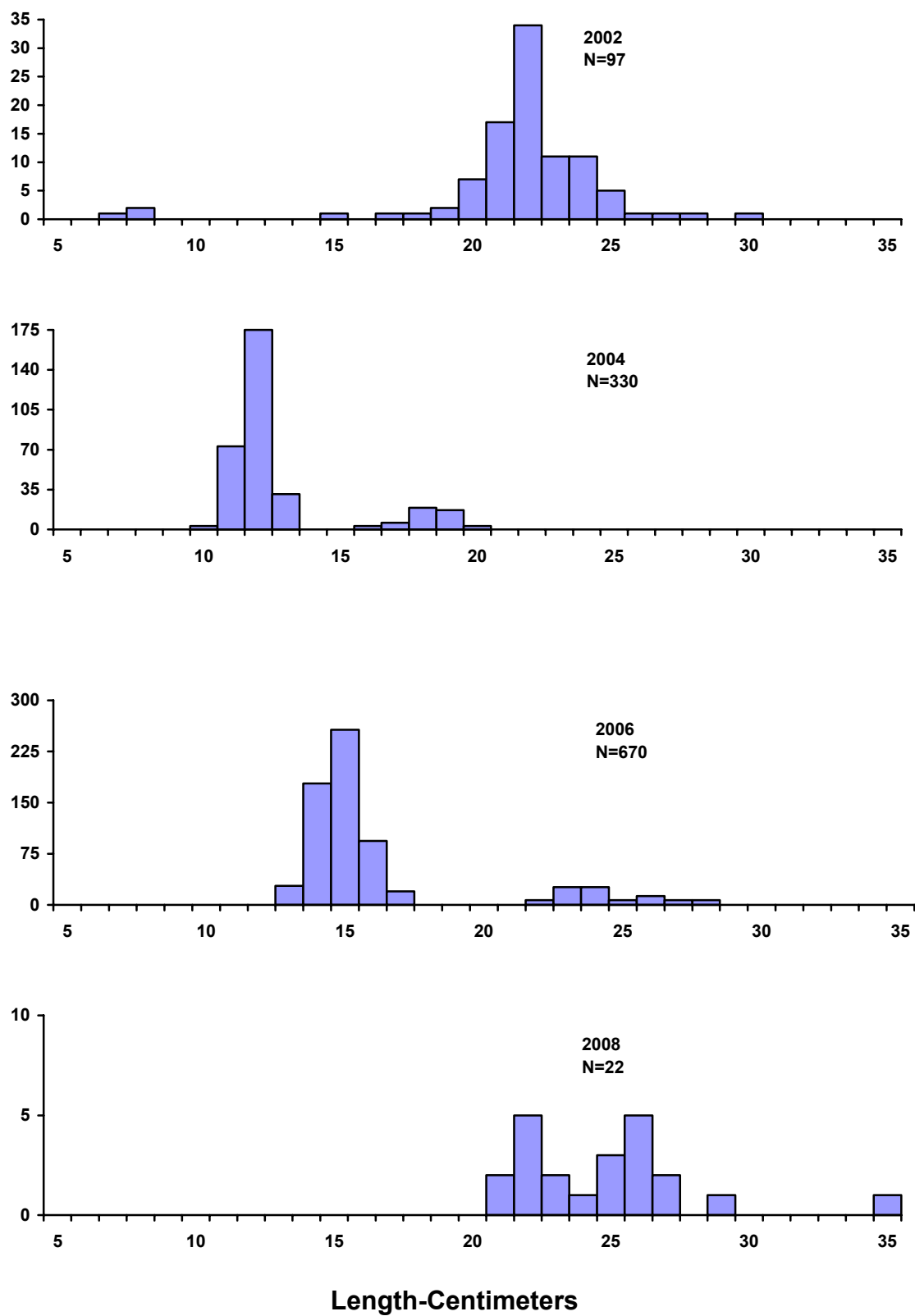
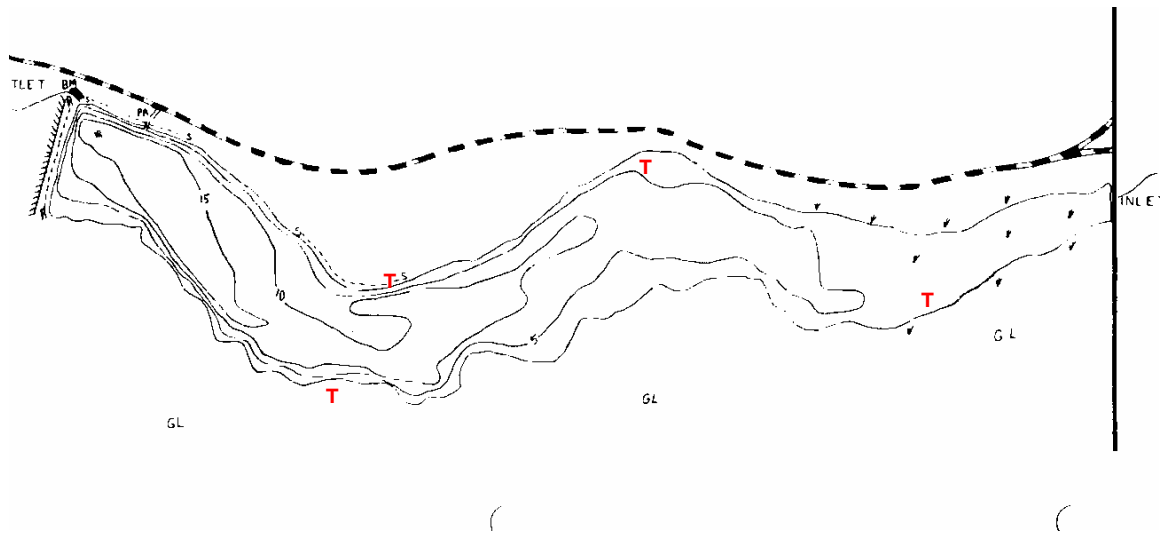


Figure 3. Length frequency histograms for black crappies sampled with trap nets in Lake, Hanson, Hanson County, 2002, 2004, 2006, 2008.



Legend

Trap Net Sites: T

Figure 4. Sampling locations on Lake Hanson, Hanson County, 2008.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$\text{PSD} = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$\text{RSD-P} = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.